

radiotherapy < 0.2 ng/mL. Salvage RT was defined as radiation delayed until PSA rose above a threshold ( $\geq 0.2$  ng/mL). All patients were followed for three years.

**Results:** Forty-nine patients (pre-GUROC:  $n = 20$ , post-GUROC:  $n = 29$ ) met the inclusion criteria. Age, clinical, and pathological factors were similar between the two cohorts, including rates of ECE, SVI and post RP PSA ( $p > 0.05$ ), however, there were more patients with positive margins in the post-GUROC cohort (50% versus 79%,  $p = 0.03$ ). Rate of aRT offered was not significantly different between the pre- versus post-GUROC cohort, 65% versus 69%, ( $p > 0.05$ ). Furthermore, no differences were noted between the rate of salvage RT or no RT offered between the cohorts: 15% versus 10% ( $p > 0.05$ ), and 20% versus 21% ( $p > 0.05$ ), respectively.

**Conclusions:** Two-thirds of eligible prostate cancer patients referred to radiation oncologists in a particular Canadian province were offered aRT. This practice pattern did not significantly change after the publication of the GUROC recommendations.

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#### RADIOTHERAPY OF THE PRIMARY TUMOUR FOR METASTATIC PROSTATE CANCER

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**Purpose:** The standard treatment for men with newly diagnosed metastatic prostate cancer (mPCa) is androgen deprivation therapy (ADT). Local radiotherapy (RT) to the prostate has traditionally been reserved for men who require symptomatic relief in patients with metastatic disease. However, local RT may have other benefits in addition to symptomatic relief. This study investigates the impact of local RT on overall survival (OS) in men with newly diagnosed mPCa.

**Methods and Materials:** This is a retrospective, population-based study of patients age  $\geq 18$  years diagnosed with metastatic (M1) prostate cancer in Manitoba between 2004-2013. Patients with neuroendocrine or small cell histology were excluded. Data was collected from Cancer Registry and electronic charts including age, T/N/M stage, PSA, Charlson comorbidity score, RT, surgery, systemic therapy, Gleason score, and ECOG performance status. Cox regression was used to predict OS. Likelihood ratio testing was used to identify factors associated with OS. A  $p$  value < 0.05 was considered significant.

**Results:** A total of 323 patients were included and 25 (7.7%) received RT to the prostate within one year of diagnosis. The median follow up was 2.21 years. The mean age was 71.9 years. Clinical T stage included T1 (9.3%), T2 (26.6%), T3 (21.7%) and T4 (10.5%) and TX (31.9%), N stage ranged from N0 (21.4%), N1 (37.5%), NX (41.2%). M stages consisted of M1a/M1b (63.5%), M1c (14.2%) or MX (22.3%). Of the 25 patients who received prostate RT, 15 received high dose ( $\geq 50$  Gy) and 10 low dose (< 50 Gy). Multivariable analysis showed a hazard ratio (HR) for death of 1.09 (95% CI 0.64-1.85,  $p = 0.75$ ) for patients receiving prostate RT (any dose) compared to those without prostate RT. Furthermore, the HR for high dose RT was 0.73 (95% CI 0.35-1.53,  $p = 0.41$ ) and 1.77 (95% CI 0.89-3.52,  $p = 0.1$ ) for low dose RT.

**Conclusions:** In this cohort of patients with newly diagnosed mPCa, there was no association between RT to the prostate and OS. However, this study was limited by statistical power and additional investigation in a larger population is needed.

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#### ASSESSMENT OF BIOCHEMICAL OUTCOME WITH INCREASING DOSE ESCALATION IN LOCALIZED PROSTATE CANCER (PCA) WITH PRECISION IMAGE-GUIDED RADIOTHERAPY (IGRT)

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**Purpose:** Dose escalation (DE) increases biochemical and local control in PCa. Addition of image guidance improves outcomes of highly conformal techniques. However, the benefit of DE and optimal fractionation in the context of IGRT remains unknown. Herein, we determine biochemical outcomes in three patient cohorts treated with progressively DE schemes and daily image-guidance (IG).

**Methods and Materials:** We analyzed prospectively collected data from a single Institution. Departmental standard included three sequential prostate-only schedules, A: 75.6 Gy (1.8 Gy/d); B: 79.8 Gy (1.9 Gy/d); C: 78 Gy (2 Gy/d). Daily IG consisted of fiducial markers and daily orthogonal imaging (predominantly A and B) or cone beam CT (mainly C). Patients were categorized into NCCN risk categories, and intermediate-risk (IR) subdivided into favourable and unfavourable (Zumsteg's criteria). Primary endpoint was biochemical recurrence (BCR) by Phoenix definition (PSA nadir + 2 ng/ml). Biochemical relapse-free rates (bRFR) were compared between three dose schedules and risk groups using Cox proportional hazard models and Kaplan-Meier method.

**Results:** Nine hundred and eighty-seven patients were included with a median age of 71.7 years. Risk category distribution was 18% (low), 68% (IR) and 13% (high). Of IR patients (673), 62% were unfavourable. Two hundred and ninety-three (30%), 315 (32%) and 379 (38%) patients were treated with A, B and C, respectively. Overall, 11% of patients received ADT. Age, initial PSA, T-stage, Gleason score, use of ADT and risk category distribution were not different between three groups. Median follow up was 5.9 years (0.1-16.5): 9.0 years (0.1-16.5), 9.6 years (0.1-14.3) and 4.9 years (0.2-9.5) for A, B and C. bRFR was significantly different between A, B and C ( $p < 0.0001$ ) with five year rates of 76%, 82%, 91% and eight year rates of 54%, 64% and 80%, respectively. Overall, compared to C, those treated with A and B had a HR of 2.67 (95% CI 1.87-3.81,  $p < 0.001$ ) and 1.93 (95% CI 1.34-2.77,  $p < 0.001$ ) for BCR, respectively. In low-risk category, group A had a higher risk of BCR compared to C (HR 4.1, 95% CI 1.18-14.32,  $p = 0.027$ ), but no difference between B and C was observed ( $p = 0.17$ ). For favourable IR, A and B had increased risk of BCR (HR 4.38, 95% CI 1.68-11.4,  $p = 0.0025$  and HR 3.05, 95% CI 1.18-7.9,  $p = 0.022$ , respectively) compared to C. Findings were similar for unfavourable IR group (HR 2.24, 95% CI 1.36-3.67,  $p = 0.0015$  and HR 1.88, 95% CI 1.13-3.14,  $p = 0.015$  for A and B versus C, respectively). In high-risk category, no differences in BCR rates were observed.

**Conclusions:** We observed a possible continuous dose response and bRFR improvement with progressive DE in the context of daily IG, particularly significant for IR categories. With long-term follow up, we observed a continuous occurrence of BCR. Given the limitations of retrospective studies, our results justify further dosimetric- and technique-related factors analyses. Prospective validation of these findings and consideration for higher DE-IGRT seem warranted to improve outcomes for PCa.

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Abstract withdrawn

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#### PROGNOSTIC SIGNIFICANCE OF TONSL EXPRESSION AND THE HOMOLOGOUS RECOMBINATION PATHWAY IN INTERMEDIATE-RISK PROSTATE CANCER RECURRENCE

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